User's Manual

Device:

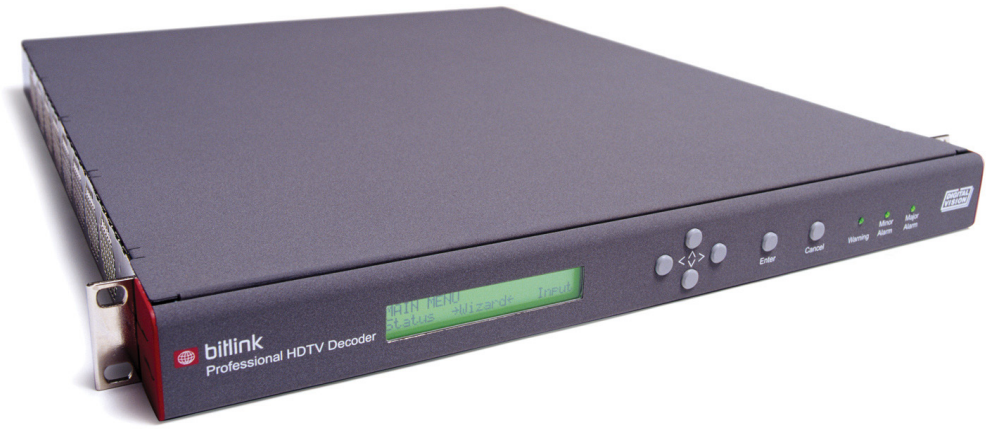
BitLink Professional HDTV Decoder

Version:

1.3

Date:

31-March-2004



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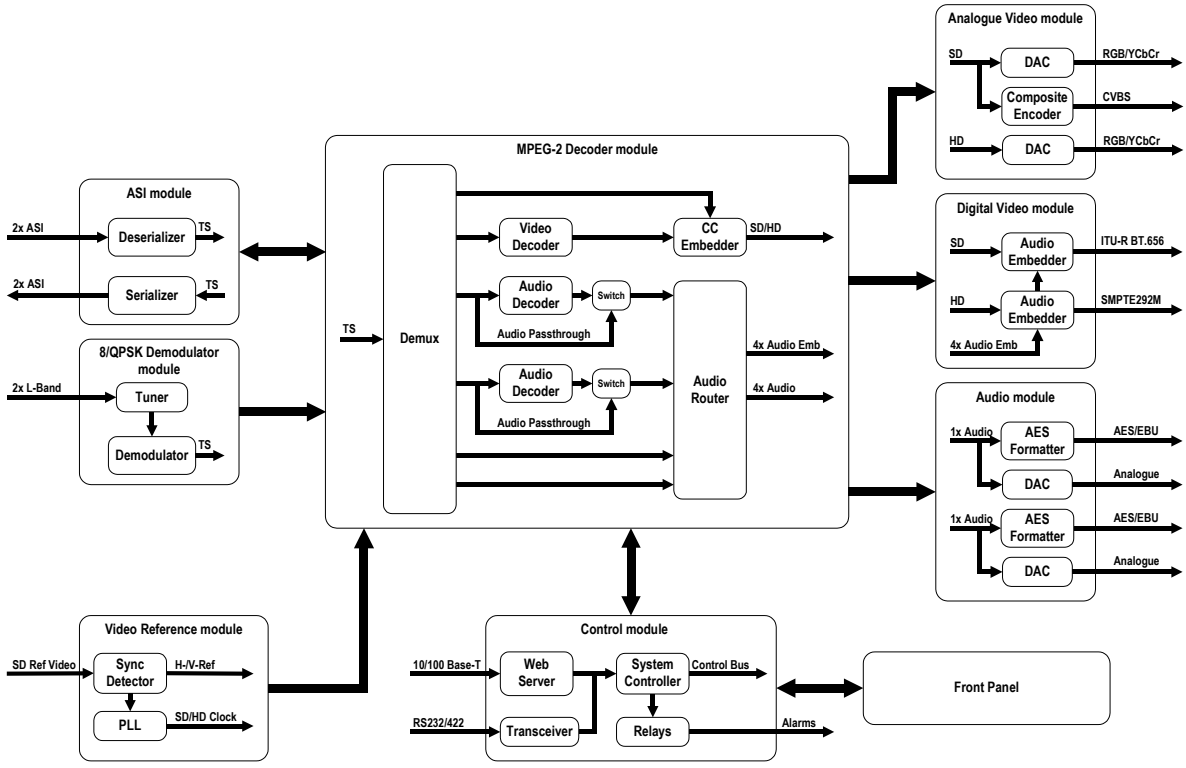
1. Overview

About the BitLink Professional HDTV Decoder



BitLink Professional HDTV Decoder block diagram

BitLink Professional HDTV Decoder

The BitLink Professional HDTV Decoder (hereinafter called the BitLink Decoder) meets the highest standards in picture quality, flexibility and reliability, for both HDTV and SDTV. The BitLink platform affords cable, satellite and terrestrial operators, plus new players, a cost effective and flexible way to transit to the DTV Market. The BitLink Decoder supports extensive decoding and system modes making it ideally suitable for use in ATSC/DVB contribution and professional network monitoring applications.

Video decoding formats cover interlaced and progressive HDTV formats as well as SDTV for both 50 and 60 Hz. Both digital and analogue video outputs are available.

The BitLink Decoder comprises of a 1RU rack-mounted, forced-air cooled frame.

Modular Approach

The BitLink Decoder was designed with modularity as a key criteria. This modularity facilitates easy adaptation to a number of different, and in some cases not so obvious, decoding/DTV applications. The I/O modules provide extensive choices in terms of transport stream interfaces, e.g. ASI, RF, analogue or digital video outputs, digital and analogue audio outputs and video reference input. All transport stream interfaces, except for the RF demodulator, also provides independent outputs that can be routed from any available input module. In this way the "decoder" can be used for format conversions, e.g. from QPSK to ASI.

General Features

- MPEG-2 MP@HL and MP@ML
- Transport stream input options include: ASI and RF
- Support for up- and down-conversions
- Up to two digital PCM and analogue audio pairs
- Pass-through of Dolby Digital (AC-3)
- Closed Caption support
- Front panel, Web or Serial control

About Dolby Digital (AC-3) decoding

The BitLink Professional HDTV Decoder is licensed for Dolby Digital decoding in non-cinema applications only. The license agreement specifically prohibits the use of the BitLink's Dolby Digital decoding in cinema applications. The user may pass-through the Dolby Digital audio to an external Dolby decoder.

2. Installation

Injury Precautions

WARNING!

If handled improperly, this equipment can be hazardous under certain conditions. During servicing, this equipment must be handled with care to avoid high voltage electric shock

Below are precautionary measures that must be considered before operating the BitLink Decoder

- **Do not operate without lid**

  To avoid electrical shock or fire hazard, do not operate this product without lid properly attached to the units. Only qualified personnel should perform servicing.

- **Use proper power cord**

  To avoid fire hazard, use only the power cord supplied with this products.

- **Do not operate in wet or damp conditions**

  To avoid electrical shock or fire hazard, do not operate this products in wet or damp conditions.

Product Damage Precautions

WARNING!

Turn off AC power to the chassis before removing or installing printed circuit assemblies, as this could result in serious damage to the unit's components.

Below are precautionary measures that must be considered before operating the BitLink Decoder

- **Use proper power source**

  Do not operate this product from a power source that supplies more or less than the voltage specified for the products.

- **Provide proper ventilation**

To prevent product overheating, provide proper ventilation and do not obstruct the ventilation areas on the units.

- **Do not operate with suspected failures**

  If you suspect there is damage to the products, have it inspected by qualified service personnel. Do not attempt to repair the failure even if you suspect it may be a minor problem.

Packaging

Visual check

When you receive the BitLink Decoder, examine the package for obvious signs of damage. The delivery should not be accepted if the packaging is damaged.

Open the packaging carefully and check for any obvious product damage incurred during shipping. If there is any damage please contact your distributor immediately.

Unpacking

- Check the equipment against the delivery/packing note when unpacked.
- Retain the packaging, as it is required for warranty shipments.
- Don't grasp the unit's front panel when unpacking.

General Installation Instructions

WARNING!

These installation instructions are for use by trained personnel only. To reduce risk of electric shock, refer servicing to qualified personnel only.

Site Requirements

An ambient temperature should be maintained between 10 deg C (45 deg F) and 40 deg C (104 deg F) at a relative humidity of 10-90% (non-condensing)

WARNING!

To avoid electric shock, never remove the unit's lid. There are no user serviceable parts inside. Refer servicing to qualified personnel. Failure to comply may result in equipment damage and/or personal injury.

WARNING!

Always remove main cord from unit before removing the front panel or the I/O modules.

Electrical power connection

WARNING!

The equipment must be grounded to avoid electrical shock. Failure to ground the unit may cause equipment damage and/or personal injury. Particular attention should be given to supply connections when connecting to power strips rather then direct connections to branch circuits.

Physical Data

Height	1RU
Width	19" (483 mm)
Depth	18.1" (461 mm)
Weight (approx) 1)	9 kg
Power (Max) 1)	60 W
Voltage	90-120 V /60 Hz
Fuse	2.0 A (slow)

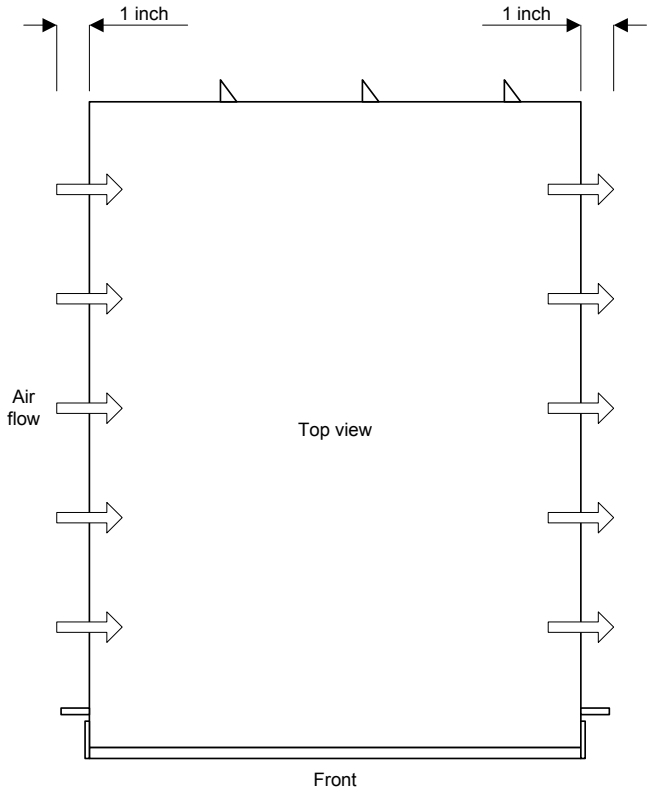
1) Depending on configuration

Also see Appendix E for full specification.

Mounting the BitLink Decoder

The BitLink Decoder has forced cooling with airflow from left to right.

When installing the BitLink Decoder, it must be placed so that there is a gap of minimum 1 inch (25 mm) on the both sides of the unit to allow for proper cooling.

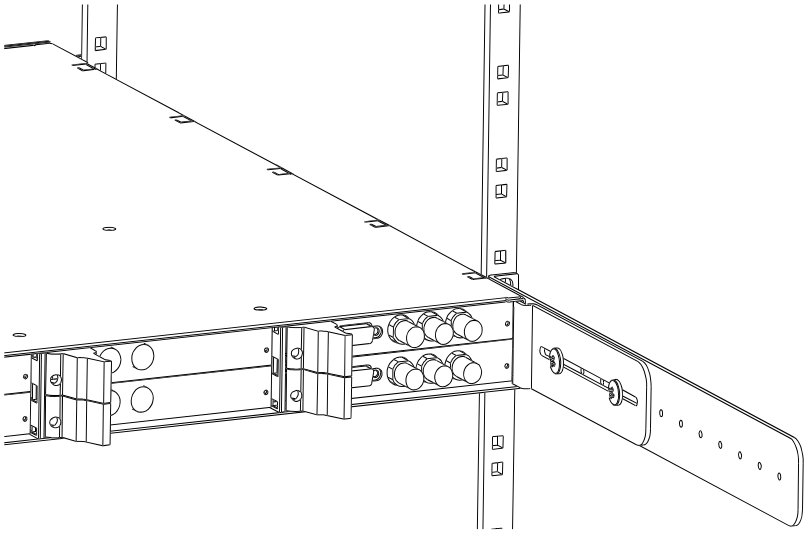


The BitLink Decoder can be mounted directly in a 19" rack, using the supplied rack mounting hardware (for both front and rear side).

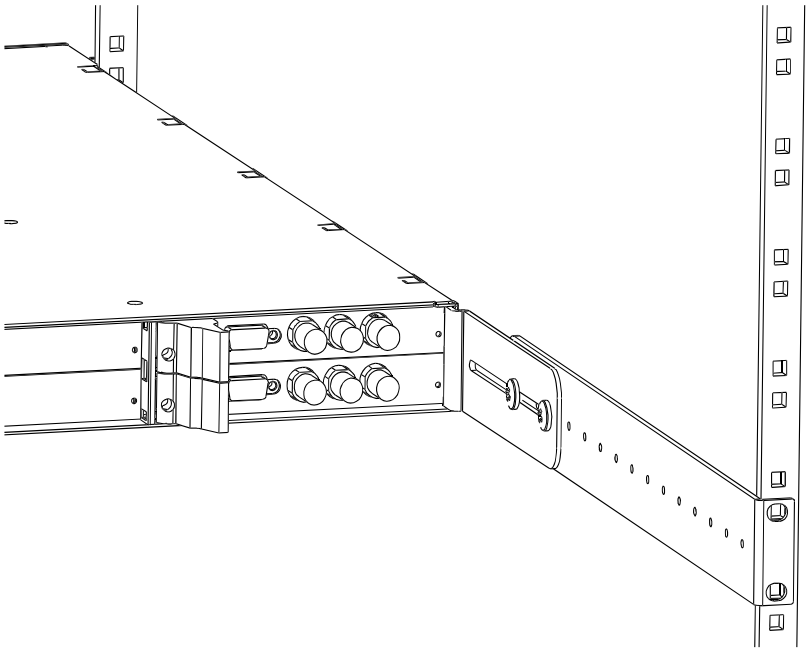
WARNING!

Do not put any extra weight on top of the BitLink Decoder when mounted in a rack.

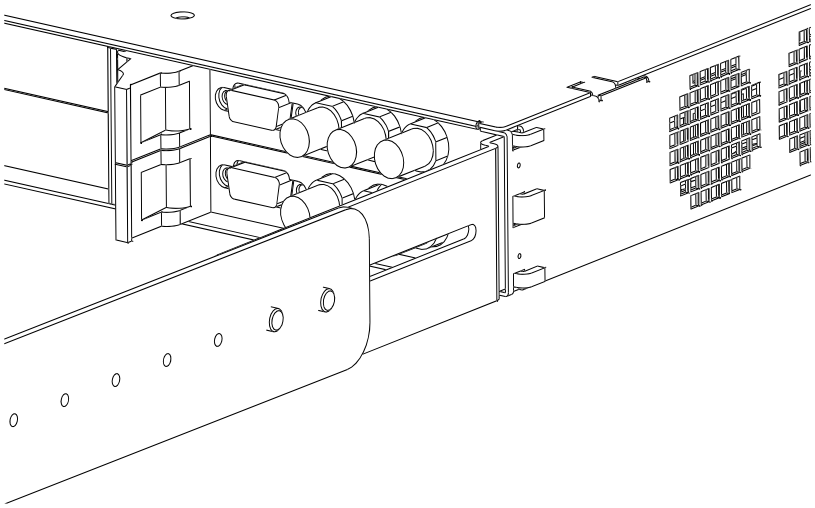
Using the Mounting Brackets



Using the brackets in a rack with short depth



Using the brackets in a rack with long depth



Brackets attached to BitLink Decoder

WARNING!

Always use two screws per side to secure the brackets.

Connecting

Transport Stream Input

Ensure you have a valid transport stream on either the ASI or the RF (demodulator) input.

Default (out of the box) setting is ASI 1.

Note! Coaxial cables for ASI inputs and outputs must be double-shielded.

Video Output

Use one of the video outputs and connect to your monitor.

Note! Coaxial cables for SDI outputs must be double-shielded.

Audio Output

Connect the audio output (if available) from the BitLink Decoder to an audio amplifier or similar.

Default (out of the box) setting is decoded audio, available on both analogue and digital outputs.

Power

After connecting TS, Video and Audio, power up the unit.

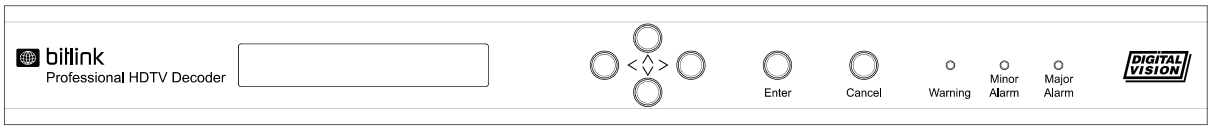
For detailed information on connectors, see Connections, page 37.

3. Getting Started

General

This section will quickly guide you through the basics of operation and how to connect and set up the BitLink Decoder from the front panel.

Front Panel operation



BitLink Decoder front panel

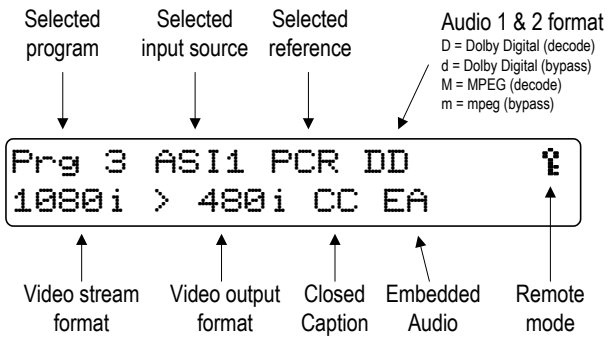
Display

The display on the front of the BitLink Decoder is a 2x24 character backlit LCD display and is used to show status, menu selections and settings.

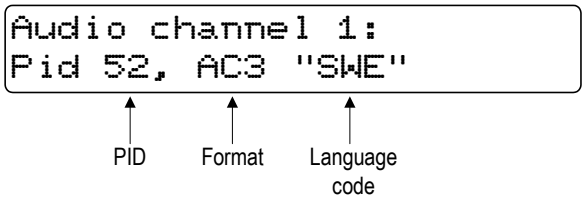
Status Menu

When powering up the BitLink Decoder, the Status menu appears. The Status menu has four different pages, which are navigated using the left and the right arrow button.

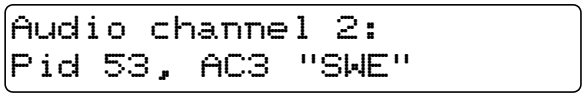
Main status and video format



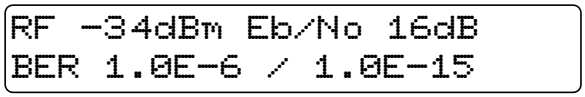
Audio channel 1 status



Audio channel 2 status

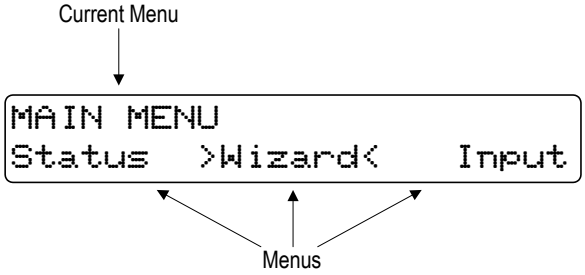


RF input level status

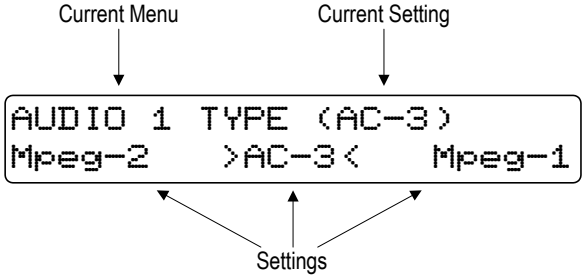


To return to the Status menu after settings has been changed or menus have been browsed press the cancel button until the Status menu is shown again.

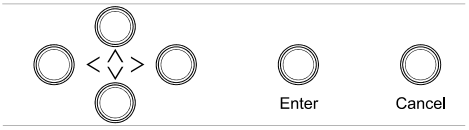
Selecting a Menu



Selecting a Setting



Menu Navigation



Navigation Buttons

- Press **Enter** to enter a new menu, selecting a setting to change and confirm the change
- Use the **Arrow buttons** to go up or down in the menu structure, browse through a menu or to change settings
- Press **Cancel** to return to a higher level in the menu structure

Changing Values

Values (e.g. PIDs) may be modified by first selecting the digit using the left or right arrow button and then increase with the up arrow button or decrease with the down arrow button.

Confirm modified value with the Enter button or press the Cancel button to cancel the change.

Alarms

Alarm Indicators

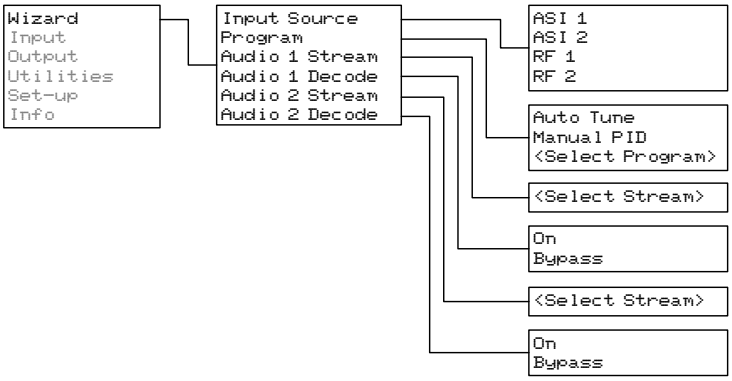
Alarms (or events) occurring are indicated on the front panel with different severities; Warning, Minor Alarm and Major Alarm. The Web interface provides information on the alarm source and an event history.

Alarms are also indicated via the Alarms connector on the rear.

To clear/reset alarms, select menu item Utilities > Clear Alarms.

The severity levels can be changed in the Web interface. Also see Appendix B for default severity levels.

Wizard menu



The Wizard is used to quickly set up the BitLink Decoder. More advanced settings are available in the other menus.

- Confirm and go to next menu item by pressing Enter.
- Use Up and Down arrows to step between menu items.
- Exit the Wizard by pressing Cancel.

Input Source

Select which input (ASI 1, ASI 2 or RF) to be used.

Program

Select which Program in the transport stream to decode.

Audio 1 Stream

The channel selection provides a list of available audio streams found in the transport stream. The selection is output to audio out 1.

Audio 1 Decode

The Decode control selects whether the audio is to be decoded (on) or sent undecoded (bypass) to digital audio out 1.

Audio 2 Stream

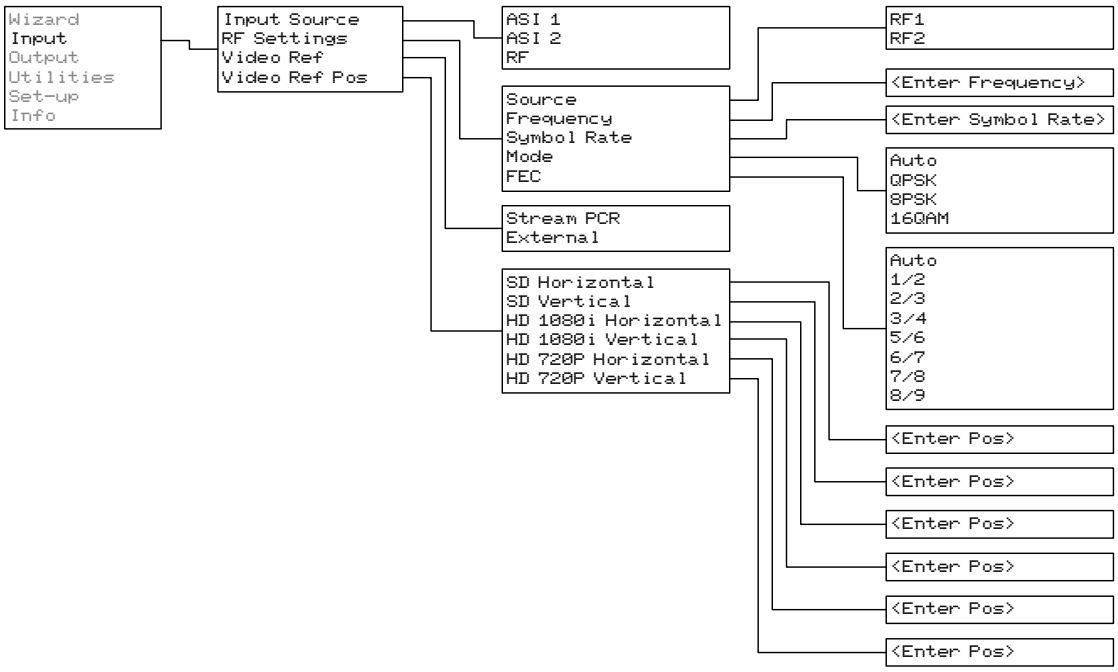
The channel selection provides a list of available audio streams found in the transport stream. The selection is output to audio out 2.

Audio 2 Decode

The Decode control selects whether the audio is to be decoded (on) or sent undecoded (bypass) to digital audio out 2.

4. Front Panel Control

Input menu



Input Source

Input > Input Source

The Input Source selection determines which TS input that will be decoded.

RF Settings

The controls found in the RF Settings menu are used for the optional QPSK Demodulator.

Source

Input > RF Settings > Source

Select RF input 1 or 2

Frequency

Input > RF Settings > Frequency

Sets L-band frequency, 950 000 – 2 150 000 kHz

Symbol Rate

Input > RF Settings > Symbol Rate

Sets Symbol rate, 1 000 000 – 45 000 000 baud.

Mode

Input > RF Settings > Mode

Selects RF Modulation mode, Auto, QPSK, 8PSK or 16QAM.

FEC

Input > RF Settings > FEC

Forward Error Correction: Auto, 1/2, 2/3, 3/4, 5/6, 6/7, 7/8 or 8/9

Note! Some FECs are not available for all modes.

QPSK	1/2, 2/3, 3/4, 5/6, 7/8
8PSK	2/3, 5/6, 8/9
16QAM	3/4, 7/8

Video Ref

Input > Video Ref

This control determines whether the video and audio outputs should be locked to the **PCR** (from the stream) or to an **external** video reference connected to the optional Video Reference module (GLK).

For detailed information on connectors, see Connections, page 37.

Note! When switching video reference, a glitch may appear on the ASI outputs.

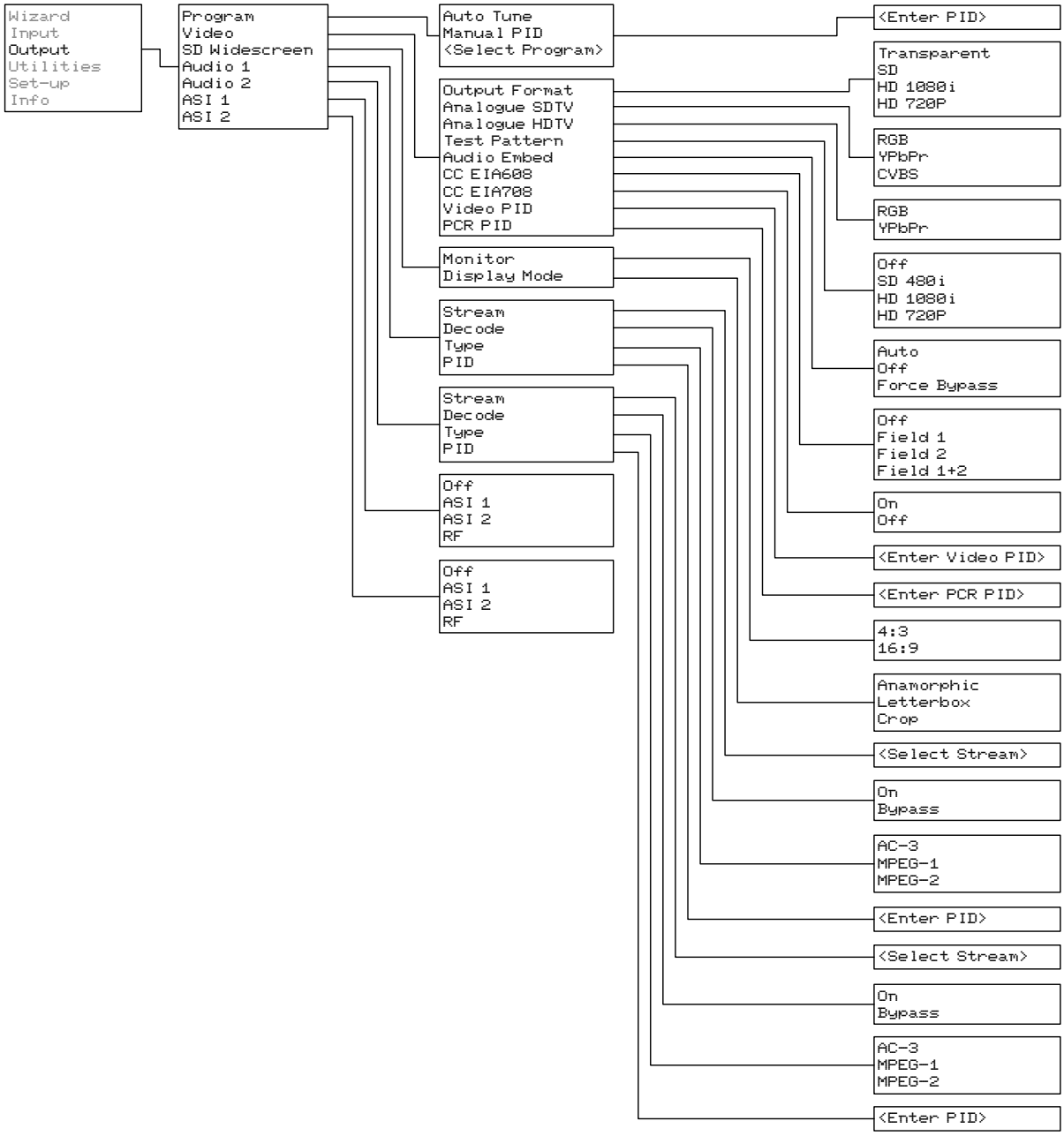
Video Ref Pos

Input > Video Ref Pos

Adjusts the video relative the video ref position up to ±1200 pixels and ±20 lines with 1 pixel/line resolution.

Audio is not affected.

Output menu



Program

Output > Program

The BitLink Decoder scans the transport stream and extracts the program information. Select the program to output from the list of the identified programs in the stream.

Auto Tune

Output > Program > Auto Tune

When Auto Tune is selected, the first program in the stream is automatically chosen.

Manual PID

Output > Program > Manual PID

Manual selection of PID.

Video

Output Format

Output > Video > Output Format

This control selects the video format to be displayed. Current selections available are:

Transparent	SD streams are displayed on the SD output. HD streams are displayed on the HD output.
SD	All streams are displayed on the SD output. HD streams are downconverted to SD.
HD 1080i	All streams are displayed on the HD output. SD streams are upconverted to HD 1080i.
HD 720P	All streams are displayed on the HD output. SD streams are upconverted to HD 720P.

Analogue SDTV

Output > Video > Analogue SDTV

Select whether the analogue SDTV output format should be RGB, YPbPr or CVBS.

Analogue HDTV

Output > Video > Analogue HDTV

Select whether the analogue HDTV output format should be RGB or YPbPr.

Note! If YPbPr is selected, the VGA output does not have a valid signal.

Test Pattern

Output > Video > Test Pattern

The BitLink Decoder can output a colour bar test pattern to verify that video is available. Select **SD 480i** for a test pattern on the SD output or **HD 1080i** or **720P** for a test pattern on the HD output. Normally **off**.

Audio Embed

Output > Video > Audio Embed

Enable to embed audio on the optional SDI outputs.

Auto	Embeds the audio, encoded or decoded, according to the Audio Decode setting.
Off	No audio embedding.
Force Bypass	Embeds the audio from the stream independent of Audio Decode setting.

CC EIA608

Output > Video > CC EIA608

Enable to embed EIA-608 Closed Caption on the SD video outputs.

CC EIA708

Output > Video > CC EIA708

Enable to embed EIA-708 Advanced Closed Caption on both SD and HD video outputs.

Video PID

Output > Video > Video PID

Manual selection of Video PID if not available in the current program. Normally the Program selection will automatically also set the PID.

PCR PID

Output > Video > PCR PID

Manual selection of PCR PID if not available in the current program. Normally the Program selection will automatically also set the PID.

SD Widescreen

Monitor

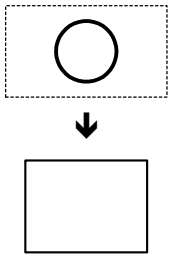
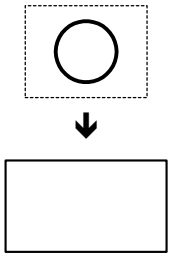
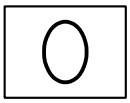
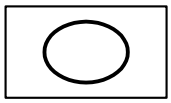
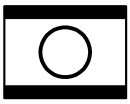
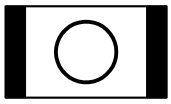
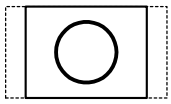
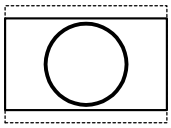
Output > SD Widescreen > Monitor

Determines the type of SDTV monitor (4:3 or 16:9).

Display Mode

Output > SD Widescreen > Display Mode

The Display Mode control determines how the stream is displayed if output picture and monitor does not match:

		 16:9 picture 4:3 monitor	 4:3 picture 16:9 monitor
Anamorphic	Does not change the picture.		
Letterbox	Compresses the picture and adds black bars (Letterbox or Pillar box) in order to display the full picture in proper aspect ratio.	 *Letterbox*	 *Pillar box*
Crop	Crops the picture in order to display full screen in proper aspect ratio.		

Audio 1

The settings found under menu Output > Audio 1 are used for audio output 1. Settings for audio out 2 are identical and found under menu Output > Audio 2.

Stream

Output > Audio 1 > Stream

The channel selection provides a list of available audio streams found in the transport stream. The selection is output to audio out 1.

Decode

Output > Audio 1 > Decode

The Decode control selects whether the audio is to be decoded or sent undecoded (bypassed) to digital audio output 1. Analogue audio is always provided.

Type

Output > Audio 1 > Type

Overrides the audio channel selection by selecting the audio type (AC-3, MPEG-1 or MPEG-2) manually.

PID

Output > Audio 1 > PID

Manual selection of Audio PID if not available in the current program. Normally the Program selection in combination with Audio Stream selection will automatically also set the PID.

Audio 2

The settings found under menu Output > Audio 2 are used for audio out 2. For description of settings see Audio 1 earlier on.

ASI 1

Output > ASI 1

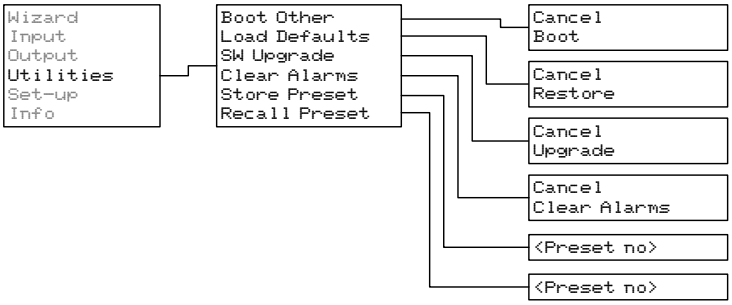
Determines the TS source to be routed to the ASI 1 output. Either ASI 1, ASI 2 or Demodulator (RF) output.

ASI 2

Output > ASI 2

Determines the TS source to be routed to the ASI 1 output. Either ASI 1, ASI 2 or Demodulator (RF) output.

Utilities menu



Boot Other

Utilities > Boot Other

Programs another BitLink Decoder via the Ethernet connection on the QMC module.

Note! Only for factory configuration.

Load Defaults

Utilities > Load Defaults

By using this control, the settings in the BitLink Decoder are restored to factory defaults.

Factory Defaults

Input Source	ASI 1 (Config 2: RF)
Program No.	None
Video PID	None
PCR PID	None
Video Output Format	Transparent
SD Monitor	4:3
SD Display Mode	Anamorphic
CC EIA608	Field 1+2
CC EIA708	Enable
Audio Embed	Enable
Test Pattern	Off
Video Ref	Stream PCR
ASI 1 Out	ASI 1
ASI 2 Out	ASI 2
RF Source	RF 1
RF Freq	1 362 000 kHz
RF Symbol Rate	14 028 731 baud

RF Mode	QPSK
RF FEC	3/4
Audio 1 & 2 Stream	None
Audio 1 & 2 Decode	On
Audio 1 & 2 Type	Unknown
Analogue SDTV	CVBS
Analogue HDTV	RGB
Video ref Pos SD hor.	0
Video ref Pos SD ver.	0
Video ref Pos HD 1080i hor.	0
Video ref Pos HD 1080i ver.	0
Video ref Pos HD 720P hor.	0
Video ref Pos HD 720P ver.	0

1) Settings not listed above are not affected.

SW Upgrade

Utilities > SW Upgrade

Allows software upgrade of the BitLink Decoder via the Ethernet connection on the QMC module.

See separate instructions included with the new software.

Software upgrade is also possible via the Web interface.

Clear Alarms

Utilities > Clear Alarms

Clears/resets all current alarms indicated on the front panel and via the alarms connector on the rear.

Note! Executing Clear Alarms will also clear the Event History in the Web interface.

Store Preset

Utilities > Store Preset

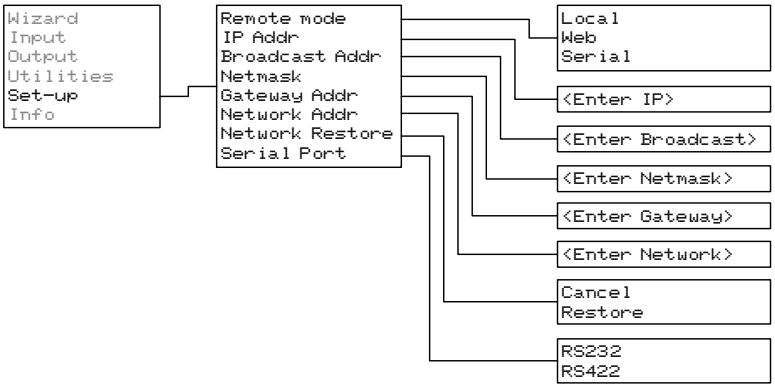
10 presets storing Input/Output settings.

Recall Preset

Utilities > Recall Preset

10 presets recalling Input/Output settings.

Set-up menu



The set-up menu is used to configure the BitLink Decoder for control via Ethernet and the built-in web control interface.

Remote Mode

Set-up > Remote Mode

Determines how to control the BitLink Decoder; Local (front panel), Web (web interface via Ethernet connector on the QMC module) or Serial (RS232 or RS422 on the QMC module).

Note! Only one Remote mode at the time is available. I.e. if Web is selected, control is not possible from the front panel even if settings can be viewed.

To obtain protocol information for serial control of the BitLink Decoder, see Serial Control, page 35.

IP Addr

Set-up > IP Addr

Sets the IP address of the BitLink Decoder.

Default IP address is 192.168.80.200.

Broadcast Addr

Set-up > IP Addr

Sets the Broadcast address of the BitLink Decoder.

Default address is 192.168.80.255.

Netmask

Set-up > Netmask

Sets the Netmask of the BitLink Decoder.

Default Netmask is 255.255.255.0.

Gateway Addr

Set-up > Gateway Addr

Sets the Gateway of the BitLink Decoder.

Default Gateway address is 192.168.80.1.

Network Addr

Set-up > Network Addr

Sets the Network of the BitLink Decoder.

Default Network address is 192.168.80.0.

Network Restore

Set-up > Network Restore

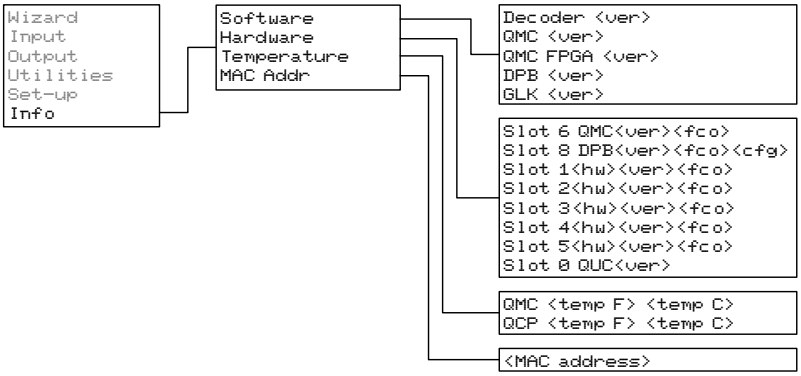
Select Restore to set all addresses to factory default.

Serial Port

Set-up > Serial Port

When Serial is selected as Remote mode, this control is used to select RS232 or RS422.

Info



Software

Info > Software

Displays the software version on the decoder and all the different modules.

Hardware

Info > Hardware

Displays the hardware version, FCO level and for DPB, the I/O configuration, on the different modules and in which slots they are mounted.

Empty slots or modules not detected will be indicated as e.g. “Slot 1 No board”.

Non-working modules will be indicated as e.g. “Slot 1 ASI Error”

Temperature

Info > Temperature

Displays the temperature on the QMC and the QCP (the power supply) in both Fahrenheit and Celsius.

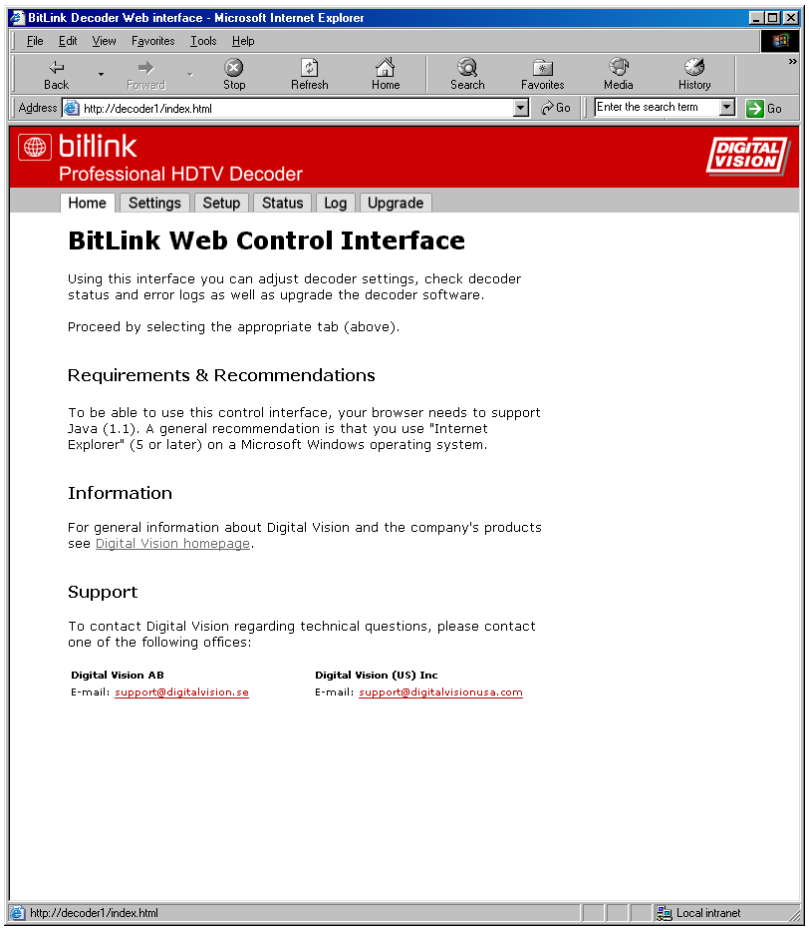
MAC Addr

Info > MAC Addr

Displays the Media Access Control (MAC) address of the BitLink Decoder, e.g. 00:50:C2:11:B2:65.

5. Web Control

General


BitLink Decoder Web interface - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address http://decoder1/index.html
Go
Enter the search term
Go
bitlink
Professional HDTV Decoder
DIGITAL VISION
Home Settings Setup Status Log Upgrade
BitLink Web Control Interface
Using this interface you can adjust decoder settings, check decoder status and error logs as well as upgrade the decoder software.
Proceed by selecting the appropriate tab (above).
Requirements & Recommendations
To be able to use this control interface, your browser needs to support Java (1.1). A general recommendation is that you use "Internet Explorer" (5 or later) on a Microsoft Windows operating system.
Information
For general information about Digital Vision and the company's products see Digital Vision homepage.
Support
To contact Digital Vision regarding technical questions, please contact one of the following offices:
Digital Vision AB
E-mail: support@digitalvision.se
Digital Vision (US) Inc
E-mail: support@digitalvisionusa.com
http://decoder1/index.html
Local intranet

The built-in webserver provides a simple way of controlling and monitoring the BitLink Decoder remotely. The web control interface also gives a good overview of settings including alarms log.

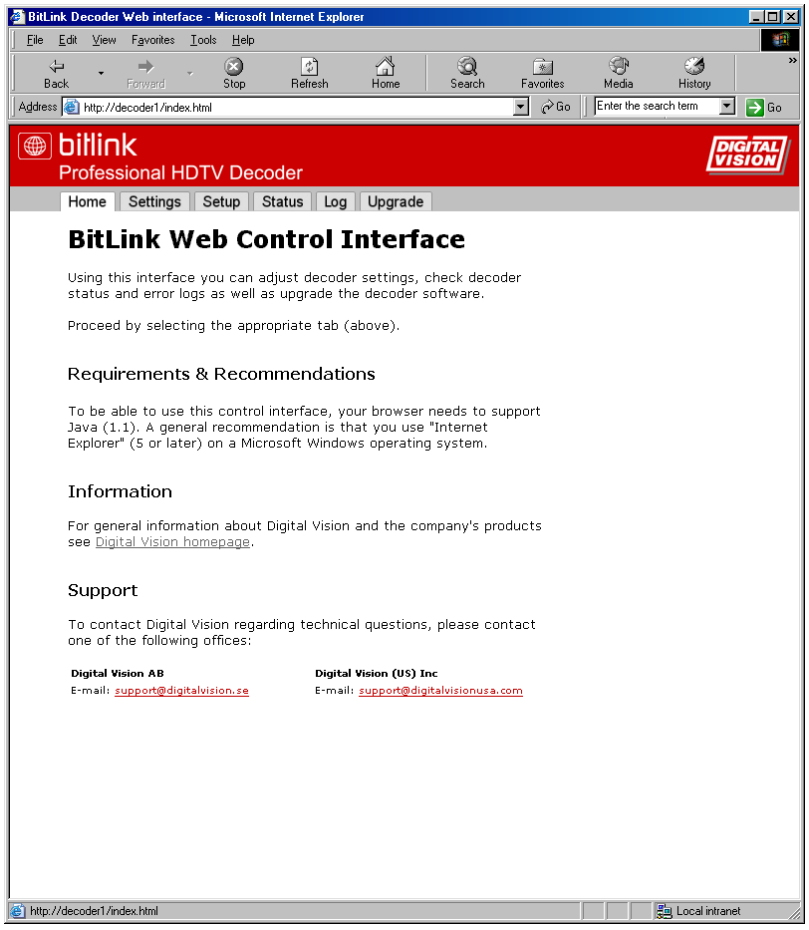
Configuration

1. While in Local control mode, select set-up menu from the front panel and set IP address, Netmask, Gateway and Network.
2. Connect the BitLink Decoder to your network using a standard RJ-45 Ethernet cable.
3. From the front panel, select menu Utilities > Remote > Web.

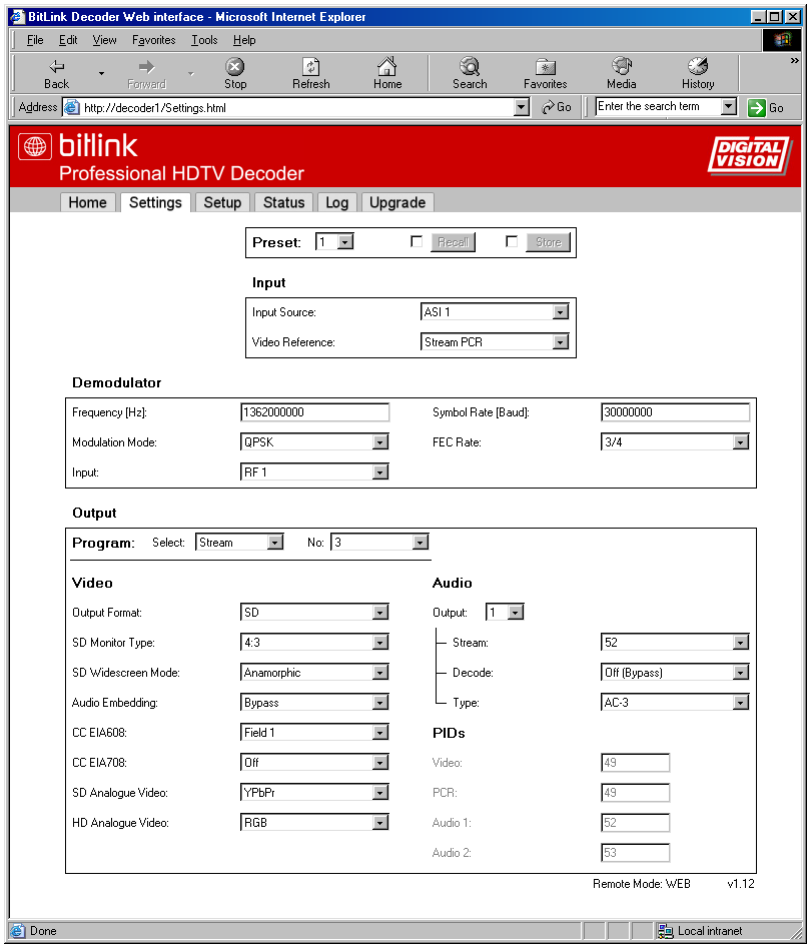
Note! It is only possible to use a remote control at the time. Therefore, while the web interface is used, the front panel (local) control is locked. To return to front panel control, select menu Utilities > Remote > Local.

Starting

Start Internet Explorer. Type in the IP address (previously set-up from the front panel) in the address field.


BitLink Decoder Web interface - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address http://decoder1/index.html
Go
Enter the search term
Go
bitlink
Professional HDTV Decoder
DIGITAL VISION
Home Settings Setup Status Log Upgrade
BitLink Web Control Interface
Using this interface you can adjust decoder settings, check decoder status and error logs as well as upgrade the decoder software.
Proceed by selecting the appropriate tab (above).
Requirements & Recommendations
To be able to use this control interface, your browser needs to support Java (1.1). A general recommendation is that you use "Internet Explorer" (5 or later) on a Microsoft Windows operating system.
Information
For general information about Digital Vision and the company's products see Digital Vision homepage.
Support
To contact Digital Vision regarding technical questions, please contact one of the following offices:
Digital Vision AB
E-mail: support@digitalvision.se
Digital Vision (US) Inc
E-mail: support@digitalvisionusa.com
http://decoder1/index.html
Local intranet

Settings



Preset

Presets are used to store and recall all the settings available on the Settings page.

Up to 10 presets may be used.

Note! To be able to use the Recall or Store button, the corresponding checkbox has to be activated.

Input

Input Source

The Input Source selection determines which TS input that will be decoded.

Video Ref

This control determines whether the video and audio outputs should be locked to the **PCR** (from the stream) or to an **external** video reference connected to the optional Video Reference module (GLK).

For detailed information on connectors, see Connections, page 37.

Demodulator

The controls found in the Demodulator section are used for the optional QPSK Demodulator.

Frequency

Sets L-band frequency, 950 000 – 2 150 000 kHz

Modulation Mode

Selects RF Modulation mode, Auto, QPSK, 8PSK or 16QAM.

Symbol Rate

Sets Symbol rate, 1 000 000 – 45 000 000 baud.

FEC Rate

Forward Error Correction: Auto, 1/2, 2/3, 3/4, 5/6, 6/7, 7/8 or 8/9.

Note! Some FECs are not available for all modes.

QPSK	1/2, 2/3, 3/4, 5/6, 7/8
8PSK	2/3, 5/6, 8/9
16QAM	3/4, 7/8

Output

Program

The BitLink Decoder scans the transport stream and extracts the program information. Select the program to output from the list of the identified programs in the stream.

Video

Output Format

This control selects the video format to be displayed. Current selections available are:

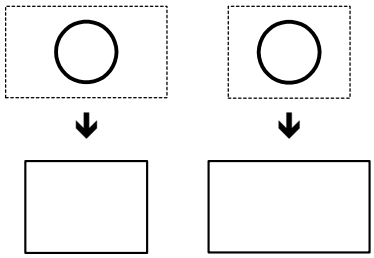
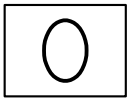
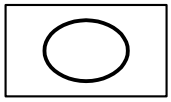
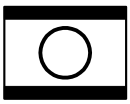
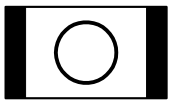
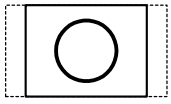
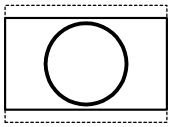
Transparent	SD streams are displayed on the SD output. HD streams are displayed on the HD output.
SD	All streams are displayed on the SD output. HD streams are downconverted to SD.
HD 1080i	All streams are displayed on the HD output. SD streams are upconverted to HD 1080i.
HD 720P	All streams are displayed on the HD output. SD streams are upconverted to HD 720P.

SD Monitor Type

Determines the aspect ratio of the SDTV monitor (4:3 or 16:9).

SD Widescreen Mode

The SD Widescreen Mode control determines how the stream is displayed if output picture and monitor does not match:

		 16:9 picture 4:3 monitor	4:3 picture 16:9 monitor
Anamorphic	Does not change the picture.		
Letterbox	Compresses the picture and adds black bars (Letterbox or Pillar box) in order to display the full picture in proper aspect ratio.	 *Letterbox*	 *Pillar box*
Crop	Crops the picture in order to display full screen in proper aspect ratio.		

Audio Embedding

Enable to embed audio on the optional SDI outputs.

CC EIA608

Enable to embed EIA-608 Closed Caption on the SD video outputs.

Video PID

The Program selection will automatically set the Video PID.

By selecting the checkbox, a PID can be entered manually.

PCR PID

The Program selection will automatically set the PCR PID.

By selecting the checkbox, a PID can be entered manually.

Analogue Video (SD)

Select whether the analogue SDTV output format should be RGB, YPbPr or CVBS.

Analogue Video (HD)

Select whether the analogue HDTV output format should be RGB or YPbPr.

Note! If YPbPr is selected, the VGA output does not have a valid signal.

Audio

Audio Output

The settings below are valid for the selected Audio Output.

Service

The service selection provides a list of available audio streams found in the transport stream. The selection is output to the selected audio output.

Decoding

The Decoding control selects whether the audio is to be decoded or sent undecoded (bypassed) to digital audio output 1. Analogue audio is always provided.

Audio Type

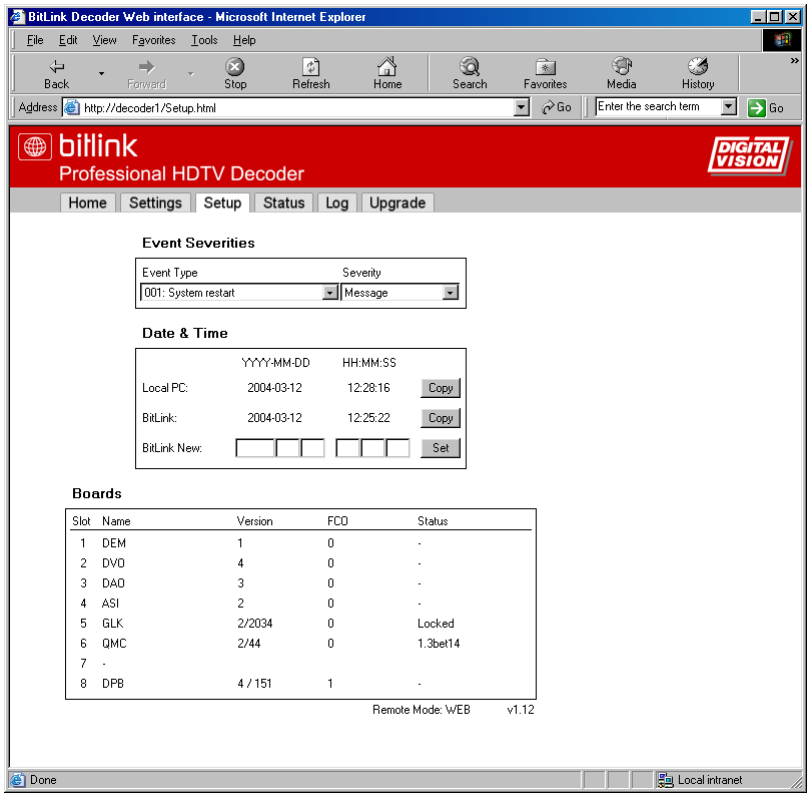
Overrides the audio channel selection by selecting the audio type (AC-3, MPEG-1 or MPEG-2) manually.

Audio PID

The Program selection in combination with selected Audio Service will automatically set the Audio PID.

By selecting the checkbox, a PID can be entered manually.

Setup



Event Severities

Sets the severity of different events to be indicated in the Event History, the Front Panel and the Alarms connector.

Note! The severity Message will not be indicated on the front panel or Alarms connector.

See Appendix B for default severity levels.

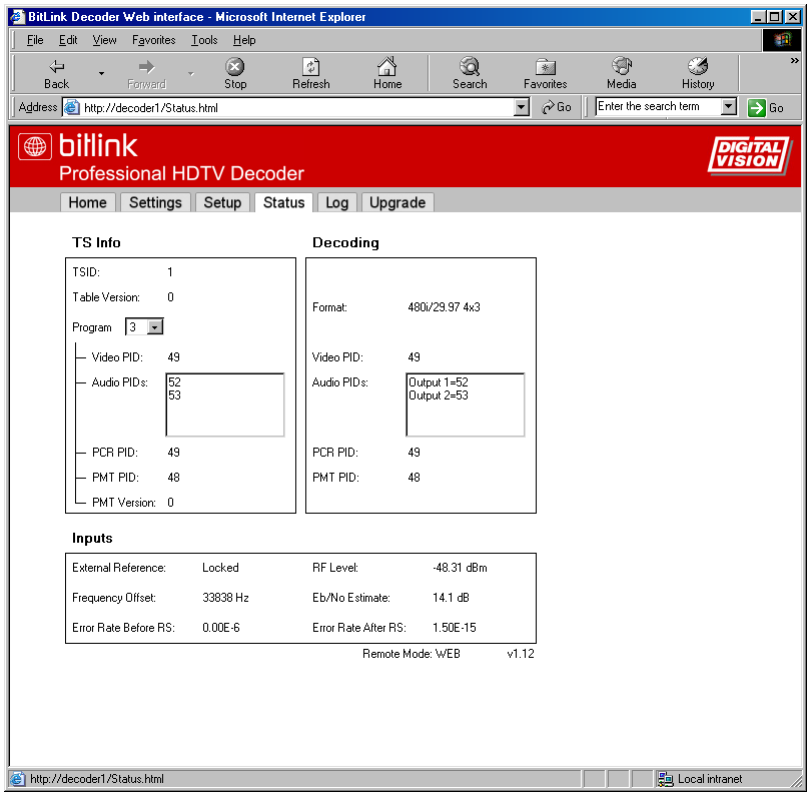
Date & Time

Sets date and time for the BitLink Decoder. Important for the Event History.

Boards

Displays the hardware version, FCO level on the different modules and in which slots they are mounted.

Status



TS Info

Provides information on input TS stream such as program number and PIDs.

Decoding

Provides information on current decoding program such as name and PIDs.

Inputs

Information on whether the BitLink Decoder is locked or unlocked to the external video reference.

RF Status

RF Level is the RF input level in dBm.

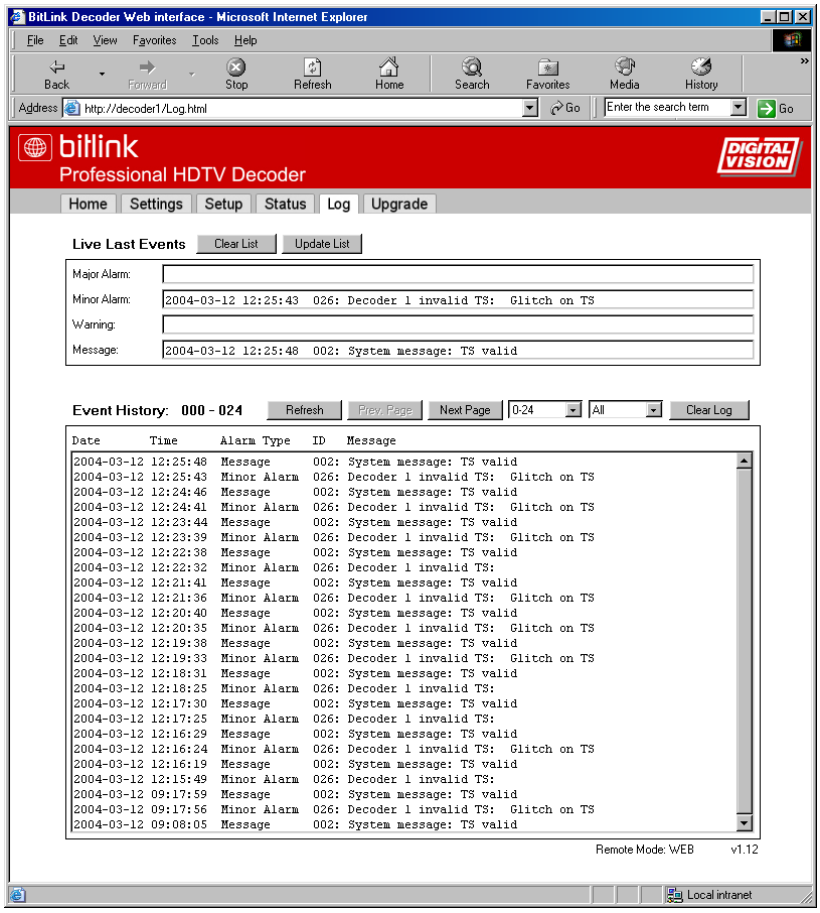
Frequency Offset is the carrier frequency offset in Hz.

Eb/No Estimate in dB.

Error Rate Before RS (Reed Solomon) byte rate/s.

Error Rate After RS in bits/s.

Log


BitLink Decoder Web interface - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address http://decoder1/Log.html
Go
Enter the search term
Go
bitlink
Professional HDTV Decoder
DIGITAL VISION
Home Settings Setup Status Log Upgrade
Live Last Events
Clear List
Update List
Major Alarm:
Minor Alarm:
2004-03-12 12:25:43 026: Decoder 1 invalid TS: Glitch on TS
Warning:
Message:
2004-03-12 12:25:48 002: System message: TS valid
Event History: 000 - 024
Refresh
Prev. Page
Next Page
0-24
All
Clear Log
Date Time Alarm Type ID Message
2004-03-12 12:25:48 Message 002: System message: TS valid
2004-03-12 12:25:43 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:24:46 Message 002: System message: TS valid
2004-03-12 12:24:41 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:23:44 Message 002: System message: TS valid
2004-03-12 12:23:39 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:22:38 Message 002: System message: TS valid
2004-03-12 12:22:32 Minor Alarm 026: Decoder 1 invalid TS:
2004-03-12 12:21:41 Message 002: System message: TS valid
2004-03-12 12:21:36 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:20:40 Message 002: System message: TS valid
2004-03-12 12:20:35 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:19:38 Message 002: System message: TS valid
2004-03-12 12:19:33 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:18:31 Message 002: System message: TS valid
2004-03-12 12:18:25 Minor Alarm 026: Decoder 1 invalid TS:
2004-03-12 12:17:30 Message 002: System message: TS valid
2004-03-12 12:17:25 Minor Alarm 026: Decoder 1 invalid TS:
2004-03-12 12:16:29 Message 002: System message: TS valid
2004-03-12 12:16:24 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 12:16:19 Message 002: System message: TS valid
2004-03-12 12:15:49 Minor Alarm 026: Decoder 1 invalid TS:
2004-03-12 09:17:59 Message 002: System message: TS valid
2004-03-12 09:17:56 Minor Alarm 026: Decoder 1 invalid TS: Glitch on TS
2004-03-12 09:08:05 Message 002: System message: TS valid
Remote Mode: WEB
v1.12
Local intranet

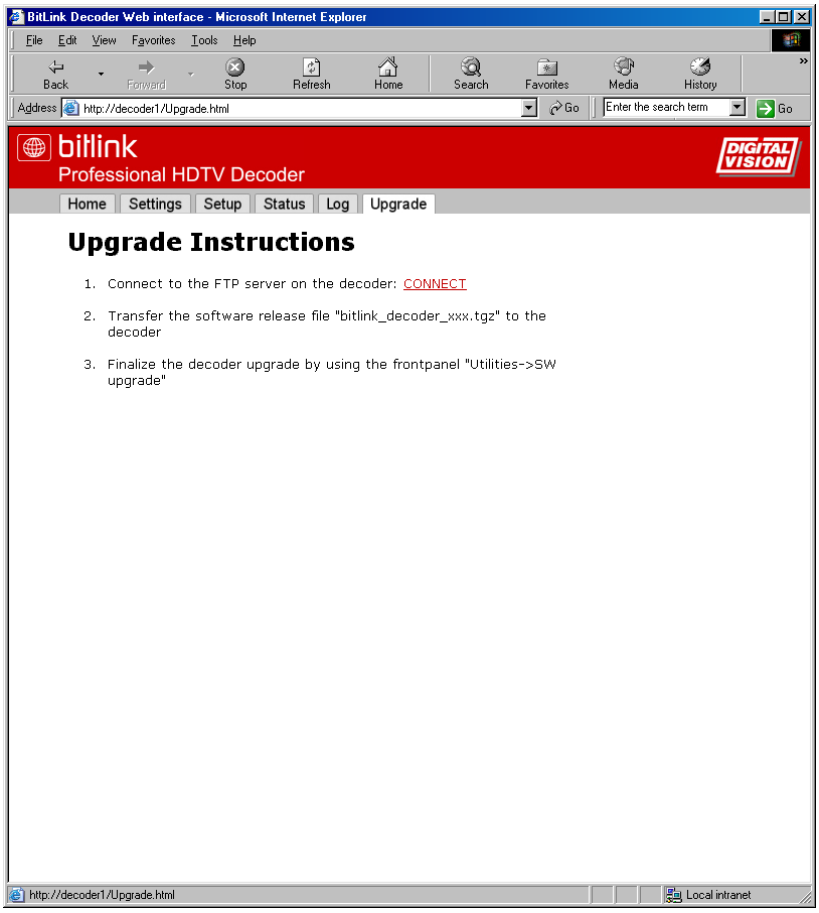
Live Last Events

Provides information on the latest event for each severity type.

Event History

The Event History provides a list/log on all events since the Clear Log button was pushed.

Upgrade


BitLink Decoder Web interface - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media History
Address http://decoder1/Upgrade.html
Go
Enter the search term
Go
bitlink
Professional HDTV Decoder
DIGITAL VISION
Home Settings Setup Status Log Upgrade
Upgrade Instructions
1. Connect to the FTP server on the decoder: CONNECT
2. Transfer the software release file "bitlink_decoder_xxx.tgz" to the decoder
3. Finalize the decoder upgrade by using the frontpanel "Utilities->SW upgrade"
http://decoder1/Upgrade.html
Local intranet

The Upgrade page allows easy software updates. Just follow the instructions.

6. Serial Control

General

Serial control from 3rd party controllers is possible via the RS232/RS422 interface.

To obtain a copy of the BitLink Decoder serial control protocol, a NDA has to be signed.

Contact one of Digital Vision's offices:

Head Office
Digital Vision AB
Solna Strandväg 98
SE-171 54 Solna
Sweden

Tel: +46 (0)8 546 182 00
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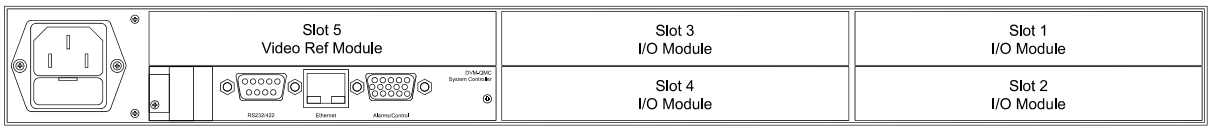
Digital Vision (US) Inc.
4605 Lankershim Blvd, Suite 700
North Hollywood, CA 91602
USA

Tel: +1 818 769-8111
Fax: +1 818 769-1888

E-mail: sales@digitalvisionusa.com
support@digitalvisionusa.com

7. Connections

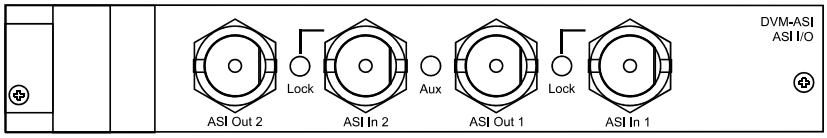
General



The BitLink Decoder has a wide range of input and output interface modules available and can be configured in a number of different ways.

The following sections will describe the different modules and their connectors.

ASI module



The ASI module provides dual ASI transport stream input and outputs.

Note! This module is optional.

ASI Out 1/2

DVB-ASI output, BNC 75 ohm (looped from input or any other TS input module).

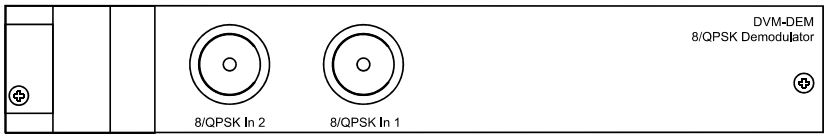
ASI In 1/2

DVB-ASI input, BNC 75 ohm.

Lock LEDs indicates when a valid transport stream is provided.

Note! Coaxial cables must be double-shielded.

8/QPSK Demodulator module (DEM)



The DEM module is an L-Band RF QPSK/8PSK/16QAM demodulator (950 – 2150 MHz) with two inputs.

Note! This module is optional.

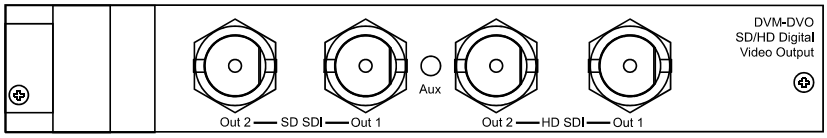
8/QPSK In 1/2

2x F-type 75 ohm. These inputs can be routed to ASI outputs.

Note! If both inputs are connected to signals with the same frequency and bitrate, the signal strength need to be reduced to –55 dBm, due to cross talk of –25 dBm between inputs.

Note! Only one input at the time can be used.

Digital Video Output module (DVO)



The Digital Video Output module (DVO) provides digital outputs separately for both SDTV and HDTV. Note that only SDTV or HDTV outputs are active at a time.

Note! This module is optional.

SD SDI Out 1/2

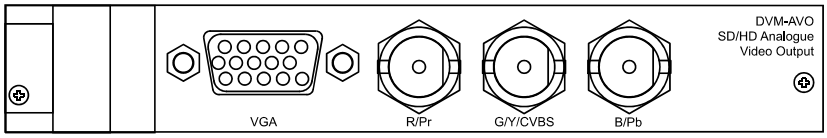
2x Serial digital SDTV output according to ITU-R BT.656.

HD SDI Out 1/2

2x Serial digital HDTV output according to SMPTE292M.

Note! Coaxial cables must be double-shielded.

Analogue Video Output module (AVO)



The Analogue Video Output module (AVO) provides analogue outputs for both SDTV and HDTV. Note that only SDTV or HDTV outputs are active at a time.

Note! This module is optional.

VGA

VGA HD output (RGBHV).

Note! Only active for HDTV and if YPbPr is selected, the VGA output does not have a valid signal.

R/Pr

Pr Colour difference signal or Red depending on the mode chosen in the menu Output > Video > Analogue Format SDTV and HDTV respectively.

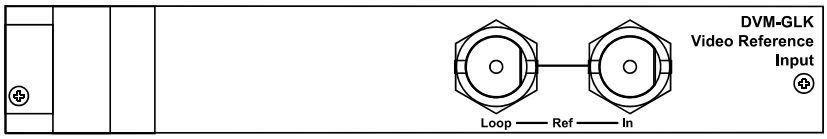
G/Y/CVBS

Luminance or Green analogue output or Composite PAL/NTSC output depending on the mode chosen.

B/Pb

Pb Colour difference signal or Blue depending on the mode chosen.

Video Reference Input module (GLK)



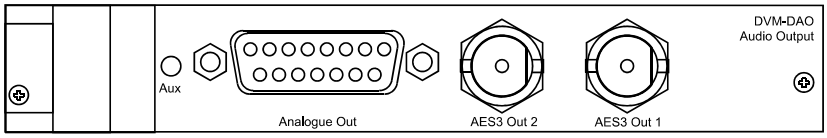
The Video Reference Input module can be used to lock the output video to an external composite video reference as an alternative to the PCR in the transport stream.

Note! This module is optional.

Video Ref

Composite video reference input with loop through according to ITU-R Rec. BT.470-3. Needs to be terminated with 75 ohm.

Audio Output module (DAO)



The Audio Output module (DAO) provides 2 channels of both analogue and digital audio.

Note! This module is optional.

Analogue Out

2 balanced stereo pairs (same as digital outputs) on 1x DB15.

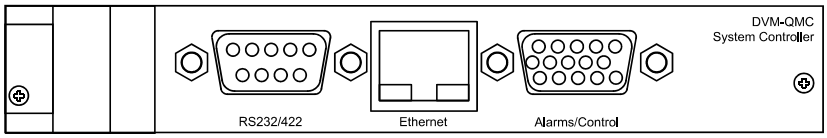
See Appendix A for pin-out.

Note! Analogue audio is only available if the audio is decoded.

AES3 Out 1/2

48kHz unbalanced digital audio outputs (SMPTE276).

System Controller module (QMC)



The System Controller module (QMC) provides an external remote/control interface.

RS232/422

The RS232 port is used for 3rd party control of the BitLink Decoder.

To obtain protocol information, see Serial Control, page 35.

See Appendix A for pin-out.

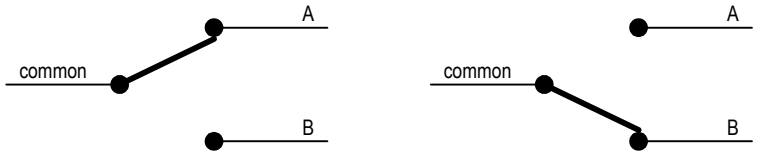
Ethernet

The Ethernet connection is used for the Web interface (see page 25) and to upgrade with new software.

Alarms/Control

The Alarms/Control connector is reserved for Alarm relays output and future implementation of GPI.

The QMC has three alarm relays, one for warning alarms, one for minor alarms and one for major alarms. Each relay is connected to three pins on the Alarms/Control port. The three pins are called "common", "A" and "B". When an alarm occurs there will be a short-circuit between "common" and "A". When no alarm is active there will be a short-circuit between "common" and "B".



Alarm active No alarm

The Alarms/Control port has two general purpose TTL inputs and two general purpose TTL outputs.

See Appendix A for pin-out.

Appendix A:
Rear Panel Connectors

Analogue Audio Out

Connector: Female DB15

1	gnd
2	Channel 1 L +
3	gnd
4	Channel 1 R +
5	gnd
6	Channel 2 L +
7	gnd
8	Channel 2 R +
9	Channel 1 L -
10	gnd
11	Channel 1 R -
12	gnd
13	Channel 2 L -
14	gnd
15	Channel 2 R –

RS232/RS422

Connector: Female DB9

RS232

1	nc
2	Tx
3	Rx
4	nc
5	gnd
6	nc
7	nc
8	nc
9	gnd

RS422

1	nc
2	Tx-
3	Rx+
4	nc

5	gnd
6	nc
7	Tx+
8	Rx-
9	nc

Alarms/Control

Connector: Female HDDB15

1	gnd
2	Major alarm A
3	Major alarm B
4	GP1 input
5	GP2 input
6	Minor alarm common
7	Major alarm common
8	Warning alarm common
9	GP1 output
10	GP2 output
11	Minor alarm A
12	Minor alarm B
13	Warning alarm A
14	Warning alarm B
15	Vcc +5V [1)]

1) The Vcc +5V comes from a DC/DC converter and will vary slightly around +5V. Any kind of control logic can be connected to the Alarms/Control connector, but if the Vcc +5V is used, the load current must not exceed 100 mA.

Appendix B:
Events and Severities

Event ID	Default Severity	Description
001	Message	System reset. QMC sets this event at start-up
002	Message	System message
008	Minor	Decoder module 1 (DPB) faulty
010	Minor	Control module (QMC) faulty
011	Minor	I/O slot 1 faulty
012	Minor	I/O slot 2 faulty
013	Minor	I/O slot 3 faulty
014	Minor	I/O slot 4 faulty
015	Minor	I/O slot 5 faulty
016	Warning	Cannot lock to reference
017	Major	High temperature (60° C / 140° F)
025	Warning	Decoder module reset
026	Message	Decoder 1 invalid TS
027	Warning	RF input level (-30dBm>RF>-65dBm)
028	Warning	RF Eb/No (<6.5 dB)
029	Warning	RF BE (<10E-3)
030	Message	RF crosstalk (>-50dBm)
031	Message	Program (PMT version changed)

Appendix C:
Input / Output Formats

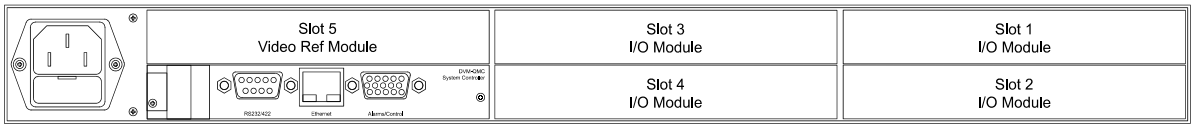
	Output Modes				
Input Format	**Transparent**	**1080i output**	**720P output**	**480i/576i output (16:9 monitor)**	**480i/576i output (4:3 monitor)**
1080i/50	1080i/50	1080i/50	720P/50	576i/50	576i/50 (select) 2)
1080i/59.94	1080i/59.94	1080i/59.94	720P/59.94	480i/59.94	480i/59.94 (select) 2)
1080i/60	1080i/60	1080i/60	720P/60	480i/59.94	480i/59.94 (select) 2)
720P/50	720P/50	1080i/50	720P/50	576i/50	576i/50 (select) 2)
720P/59.94	720P/59.94	1080i/59.94	720P/59.94	480i/59.94	480i/59.94 (select) 2)
720P/60	720P/60	1080i/60	720P/60	480i/59.94	480i/59.94 (select) 2)
576i/50 (4:3)	576i/50 1)	1080i/50 (pillar box)	720P/50 (pillar box)	576i/50 (select) 2)	576i/50
576i/50 (16:9)	576i/50 1)	1080i/50	720P/50	576i/50	576i/50 (select) 2)
480i/59.94 (4:3)	480i/59.94 1)	1080i/59.94 (pillar box)	720P/59.94 (pillar box)	480i/59.94 (select) 2)	480i/59.94
480i/59.94 (16:9)	480i/59.94 1)	1080i/59.94	720P/59.94	480i/59.94	480i/59.94 (select) 2)

1) 4:3 or 16:9 depending on selected SD Widescreen – Monitor setting

2) Anamorphic, Letterbox or Crop depending on selected SD Widescreen – Display Mode

Note! When outputs are locked to the external video reference, 60Hz formats are output as 59.94Hz

Appendix D: Configurations



Configuration 1

GLK	DAO	DEM
	ASI	DVO

Configuration 2

GLK	DAO	DEM
	AVO	DVO

Configuration 3

GLK	DAO	ASI
	AVO	DVO

Configuration 4

GLK	DAO	DEM
	ASI	AVO

Configuration 5

GLK	ASI	DEM
	AVO	DVO

Appendix E:
BitLink Decoder Specifications

Video Decoding

Standard	MPEG-2 ISO/IEC 13818-2 up to 4:2:0 Main Profile @ High Level
No. of programs decoded	Single HDTV or SDTV. HDTV programs may be down converted to SDTV format. SDTV programs may be upconverted to HDTV 1080i format
Bitrate	Up to 60 Mb/s

Formats Supported

System	Scanformat	Horizontal
1080i/50	Interlace	1920/1440/1280/960
1080i/59.94	Interlace	1920/1440/1280/960
1080i/60	Interlace	1920/1440/1280/960
720P/50	Progressive	1280/1024/960/640
720P/59.94	Progressive	1280/1024/960/640
720P/60	Progressive	1280/1024/960/640
576i/50	Interlace	720/704/640/544/480/352
480i/59.94	Interlace	720/704/640/544/480/352

Audio Decoding

Decoding	Two streams of Dolby Digital 5.1 (downmix)/stereo or MPEG stereo
Pass-through	Up to two streams of Dolby Digital (AC-3)

Closed Caption

Extraction of user data	According or ATSC/53B
Re-insertion	On line 21 according to EIA-608 on all SD outputs. Advanced Closed Caption according to EIA-708 on all SD and HD outputs.

Control

Local	Front panel control 2 x 24 character display
Web	Ethernet
Serial	RS232 or RS422, 38.4 kBaud, 8n1

Power

Voltage	90 to 120 VAC, 48 to 66 Hz
Consumption	< 60 VA
Power-up time	Typically 30 seconds until the unit can be operated, 50 seconds for video and audio output.

Mechanical

Height	1RU – 44.5 mm (1.8")
Depth	461 mm (18.1")
Width	483 mm (19")
Weight	9 kg (19.8 lbs) typical
Cooling	Forced air, side-to-side

Environmental

Operating temperature	0ºC to +40ºC (32ºF to 104ºF)
Relative humidity	Max 90% non-condensing

Safety

Approvals	ETL

ASI module (optional)

No. of inputs	2, BNC 75 ohm
Type	DVB-ASI
Outer loop demod	188
No. of outputs	2, BNC 75 ohm
Type	DVB-ASI, assignable to any TS input module

QPSK Demodulator, DEM (optional)

No. of inputs	2, F-type 75 ohm
Input return loss	>= 7 dB, 950<f<2150 Mhz
Signal strength	-25 – -65 dBm
Cross talk between inputs	-25 dBm
Type	QPSK 1/2, 2/3, 3/4, 5/6, 7/8 8PSK 2/3, 5/6, 8/9 16QAM 3/4, 7/8
Outer loop demod	188/204 auto-detect
Transmission symbol rate	1 – 45 Msps

Digital Video Output module, DVO (optional)

SDTV

No. of outputs	2
Type	ITU-R BT.656
Embedded audio	Up to 2 stereo ch, 48 kHz

HDTV

No. of outputs	2
Type	SMPTE 292M
Embedded audio	Up to 2 stereo ch, 48 KHz

Analogue Video Output module, AVO (optional)

Component SD/HD output	RGB/YPbPr, 3x BNC 75 ohm
Composite PAL/NTSC output	1x BNC 75 ohm (same as G/Y)
VGA HD output	RGBHV

Audio Output module, DAO (optional)

No. of digital outputs	2x unbalanced 48 kHz, BNC SMPTE276
No. of analogue outputs	2x balanced stereo pairs on 1x DB15

Video Reference Module, GLK (optional)

No. of inputs	1, BNC 75 ohm	
Type	Composite video acc. to ITU-R Rec. BT.470-3	
Phase adjustments	**Reference**	**Supported Formats**
	576i/50	567i/50, 1080i/50, 720P/50
	480i/59.94	480i/59.94, 1080i/59.94, 720P/59.94

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